

Listing of Claims:

Claims 1-87 (cancelled)

Claim 88 (new): A multiple fiber-optic apparatus comprising:

- a first substrate having at least a generally planar first portion of surface, wherein said first portion of surface contains at least a first pair of parallel grooves which are spaced apart in a side-by-side relationship;
- a first optical fiber comprising at least one segment length of fiber over which said first optical fiber is contiguous by being unbroken, connectorless, and spliceless;
- a pair of end-points spaced apart along said segment length of fiber and at either end of said segment length of fiber;
- a first and a second regions of side-polish, wherein each of the regions is located on said first optical fiber at a respective one of said pair of end-points;

wherein said first optical fiber is attached to said first substrate within said pair of parallel grooves at least at said pair of end-points;

whereby insertion losses inherent with breaks, connectors, and splices are avoided between said first and second regions of side-polish.

Claim 89 (new): The multiple fiber-optic apparatus of claim 88, wherein said segment length of fiber forms a flat loop defining a plane oriented generally parallel to said generally planar first portion of surface.

Claim 90 (new): The multiple fiber-optic apparatus of claim 88, wherein at least a portion of said segment length of fiber is spaced apart from contacting said first portion of surface.

Claim 91 (new): The multiple fiber-optic apparatus of claim 88, wherein at least one of said regions participates in forming one of the group consisting of an optical pass-through, an attenuator, a filter, a polarizer, a tap, a splitter, a coupler, a joiner, a modulator, an add-drop multiplexer, an add-drop demultiplexer, and a switch.

Claim 92 (new): The multiple fiber-optic apparatus of claim 88 further comprising:

a second substrate having at least a generally planar second portion of surface, wherein

said second portion of surface contains at least a second pair of parallel grooves;

a second optical fiber having at least a third region of side-polish;

a third optical fiber having at least a fourth region of side-polish;

wherein each of said second and third optical fibers is attached near said third and fourth regions of side-polish to said second substrate at least within a respective one of said second pair of parallel grooves;

wherein said first and second substrates are positioned to locate each of said first and second regions of side-polish to oppositely face and contact said third and fourth regions of side-polish respectively; and

wherein said first and third regions of side-polish form part of a first four-port fiber-optic device, and said second and fourth regions of side-polish form part of a second four-port fiber-optic device.

Claim 93 (new): The multiple fiber-optic apparatus of claim 92 further comprising:

at least one wavelength-selective diffraction device located within said first four-port fiber-optic device;

at least one other wavelength-selective diffraction device located within said second four-port fiber-optic device;

wherein said multiple fiber-optic apparatus can operate as an add/drop routing apparatus for wavelength-dependent optical signals between said first optical fiber and said third and fourth optical fibers.

Claim 94 (new): A multiple fiber-optic apparatus, comprising:

a contiguous length of a single optical fiber comprised of at least two length-segments and
a curvilinear axis;
a region of side-polish at a respective location within each of said length-segments and on
said optical fiber, wherein each said region has a center, and wherein the axis of
said optical fiber has a general direction at each said location;
a substrate supporting at least a portion of each of said length-segments at each of said
locations;
wherein the centers of each said region lies on a common line running generally perpendicular
to each said general direction; and
wherein said optical fiber over its said contiguous length is unbroken, connectorless, and
spliceless.

Claim 95 (new): The multiple fiber-optic apparatus of claim 94, further comprising a side-by-side
array of parallel grooves on a surface of said substrate, wherein said regions lie within said
grooves.

Claim 96 (new): The multiple fiber-optic apparatus of claim 95, wherein said optical fiber is
directed along its length in opposite directions through said two segments relative to said
array.

Claim 97 (new): The multiple fiber-optic apparatus of claim 95, wherein said optical fiber is
directed along its length in the same direction through said two segments relative to said array.

Claim 98 (new): The multiple fiber-optic apparatus of claim 94, wherein at least one said region
participates in forming one of the group consisting of an optical pass-through, an attenuator, a
filter, a polarizer, a tap, a splitter, a coupler, a joiner, a modulator, an add-drop multiplexer, an
add-drop demultiplexer, and a switch.

Claim 99 (new): A multiple fiber-optic apparatus, comprising:

multiple areas of side-polish spaced apart by at least a minimum distance along a
contiguous, unbroken, connectorless, and spliceless fiber-optic fiber; and
a substrate;

wherein said multiple areas are each at least approximately elliptical in shape having both a
long axis and a short axis;

wherein said long axes are parallel to one another;

wherein said multiple areas are aligned side-by-side in a row which runs perpendicular to said
long axes; and

wherein said substrate supports said contiguous, unbroken, connectorless, and spliceless fiber-
optic fiber near each of said areas.

Claim 100 (new): The multiple fiber-optic apparatus of claim 99, wherein said long axes are
incrementally spaced apart in said row by distances less than 10 millimeters.

Claim 101 (new): The multiple fiber-optic apparatus of claim 99, wherein said minimum distance
is greater than 10 centimeters.

Claim 102 (new): The multiple fiber-optic apparatus of claim 99, wherein at least one of said
multiple areas participates in forming one of the group consisting of an optical pass-through,
an attenuator, a filter, a polarizer, a tap, a splitter, a coupler, a joiner, a modulator, an add-drop
multiplexer, an add-drop demultiplexer, and a switch.

Claim 103 (new): A fiber-optic apparatus, comprising:

a supporting substrate having a surface containing a parallel set of grooves;

a fiber containing at least a pair of spaced-apart side-polished regions each supported in a
separate one of said grooves;

a never-broken, contiguous segment of said fiber routed along a path supported partially by
said substrate to optically, physically, and seamlessly interconnect said pair of
spaced-apart side-polished regions.

Claim 104 (new): The fiber-optic apparatus of claim 103, wherein at least one of the regions participates in forming one of the group consisting of an optical pass-through, an attenuator, a filter, a polarizer, a tap, a splitter, a coupler, a joiner, a modulator, an add-drop multiplexer, an add-drop demultiplexer, and a switch.

Claim 105 (new): A fiber-optic apparatus made by steps comprising:

- providing a substrate;

- providing a single contiguous length of unbroken, connectorless, and spliceless optical fiber;

- etching a set of grooves into a planar surface of a substrate, wherein said planar surface lies generally within a plane;

- attaching portions of said unbroken, connectorless, and spliceless optical fiber to be partially recessed into at least two of said grooves, wherein a region of side-wall of said unbroken, connectorless, and spliceless optical fiber protrudes above said planar surface at each of said portions, and wherein an unattached segment of said unbroken, connectorless, and spliceless optical fiber exists between said two grooves;

- constraining said unattached segment of said unbroken, connectorless, and spliceless optical fiber into a space away from said surface; and

- polishing said regions of side-wall down to a common level with said surface, wherein at least two areas of side-polish are simultaneously created on said unbroken, connectorless, and spliceless optical fiber.

Claim 106 (new): The fiber-optic apparatus of claim 105, wherein said constraining step includes protecting said unattached segment of said unbroken, connectorless, and spliceless optical fiber from damage during said polishing step.

Claim 107 (new): The fiber-optic apparatus of claims 105 or 106, wherein said constraining step includes routing said unattached segment of said unbroken, connectorless, and spliceless optical fiber within a half-space to the side of said plane that lies opposite to said set of grooves.

Claim 108 (new): The fiber-optic apparatus of claim 105, further comprising a step of incorporating at least one of said areas of side-polish as part of one of the group consisting of an optical pass-through, an attenuator, a filter, a polarizer, a tap, a splitter, a coupler, a joiner, a modulator, an add-drop multiplexer, an add-drop demultiplexer, and a switch.

Claim 109 (new): A fiber-integrated parallel array of seamlessly interconnected fiber-optic devices comprising:

- at least one never-broken length of optical fiber;

- at least two side-polished regions mutually spaced along said never-broken length of optical fiber, wherein each of said side-polished regions at least partially is respectively comprised by one of two fiber-optic devices;

- at least one supporting substrate containing a set of parallel grooves;

wherein each of said two side-polished regions is respectively fastened within a different one of said set of parallel grooves.

Claim 110 (new): The fiber-integrated parallel array of seamlessly interconnected fiber-optic devices of claim 109;

- wherein said parallel grooves run in a common direction;

- wherein each of said two side-polished regions has a respective center; and

- wherein said centers are positioned to lie along a common line which is perpendicular to said parallel grooves.

Claim 111 (new): The fiber-integrated parallel array of seamlessly interconnected fiber-optic devices of claim 109, wherein at least one of said side-polished regions participates in forming one of the group consisting of an optical pass-through, an attenuator, a filter, a polarizer, a tap, a splitter, a coupler, a joiner, a modulator, an add-drop multiplexer, an add-drop demultiplexer, and a switch.